



Aerospace Operations Training R&D Requirements

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Flying Training Challenge

Training constraints growing...



- Resources and funding...
airspace, ranges, flying time,
mission complexity, TDY
- Equipment and personnel...
airframe wear, opstempo,
perstempo
- Safety and security...
live weapons employment,
classified systems, complex
ROE, environmental concern

... modern weapons and employment concepts require extensive airspace, large ranges, and more composite training opportunities.



DMT Training Environment

Live - Virtual - Constructive Entities



Mission: Provide *combat and combat support* forces a realistic, fully integrated environment, capable of supporting the entire training spectrum from individual training to campaign-level mission rehearsal.



Current & Future AF DMT Efforts



Today:

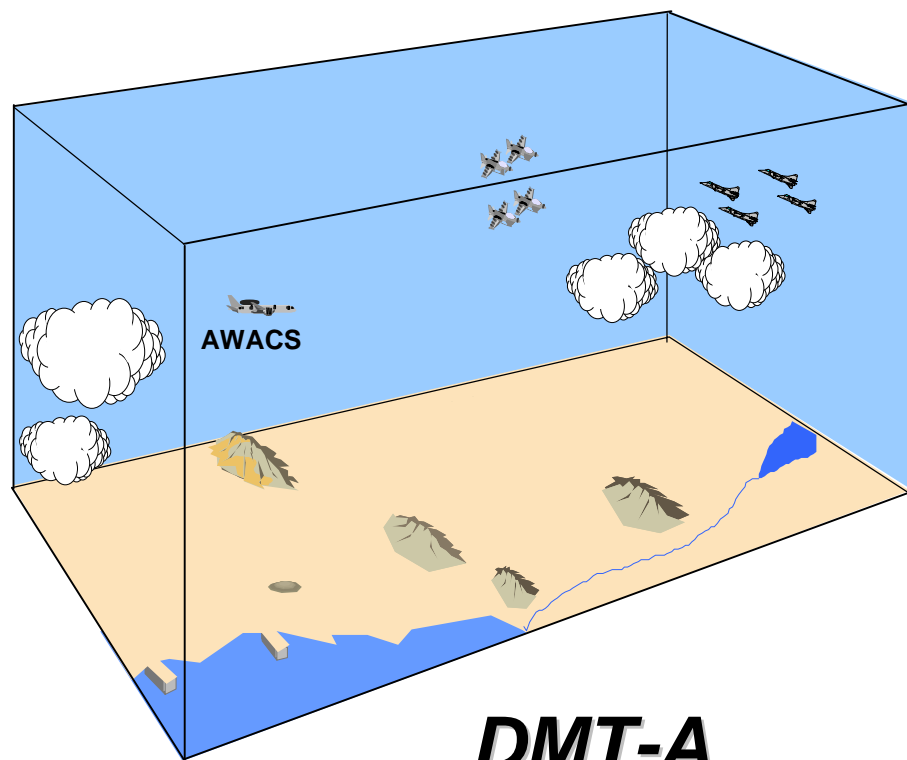
- **DMT-A**
 - F-15, F-16, AWACS Mission Training Centers
- **DMT- SO**
 - Full Mission Rehearsal Capabilities
 - AC-130U, MC-130E/H/P, MH-60K, MH-53J/K/M, MH-47
- **DMT-M**
 - DMT Ready C-5, C-17, KC-10 Flight & Boom Operator Sims

Tomorrow:

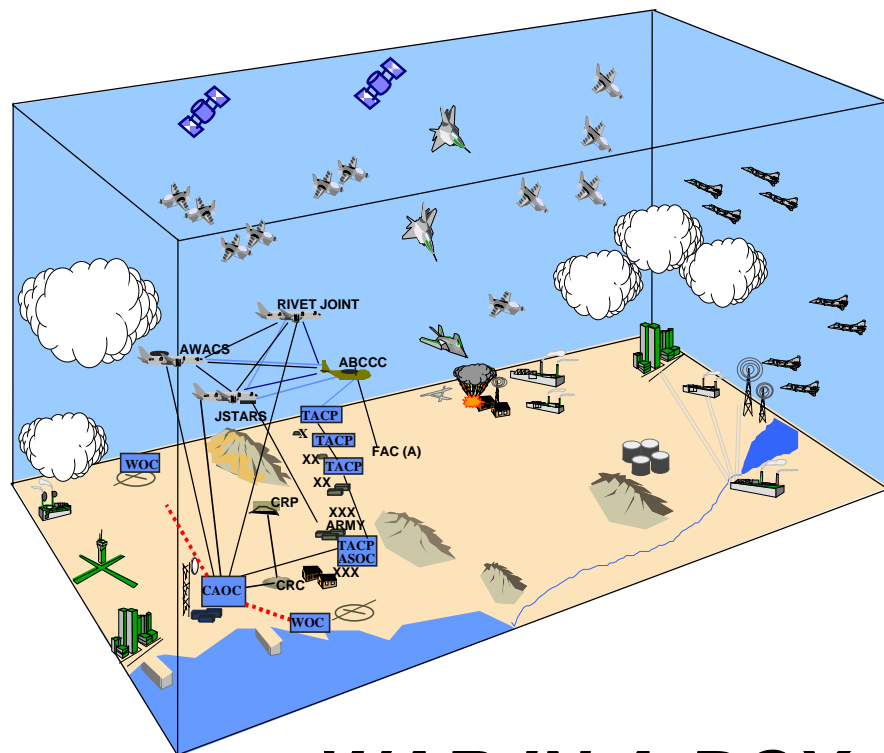
- **DMT-C2**
 - Initial Phase of Requirements Development, CAOC and DCGS
- **DMT-S**
 - Space AOC, Space Warfare Center, Missile Warning, Space Surveillance, Satellite Control, and Space C2 Units



Meeting The Aerospace Operations Training Challenge



DMT-A



WAR IN A BOX

A realistic, fully integrated
Distributed Mission Operations Environment
to train warfighters



Moving Beyond DMT-A Successes



- **DMT-A maturing**
 - Initial pilot reaction: “Outstanding” Training Device
 - Incorporating into upgrade training (MQT, FLUG, IPUG)
 - Capitalizing on fidelity, repeatability, and debriefing capability
 - Research in key technology areas continuing
- **COMACC’s emphasis – Horizontal Integration**
 - Complete Sensor-to-Shooter loop in a synthetic environment
 - DMT-O: full spectrum application of DMT-A, DMT-C2, & DMT-S
- **The Road Ahead**
 - Applying research and development to DMT-O enabling technologies
 - Developing Mission Essential Competency driven training
 - Designing distributed training events that build skilled performance in the combat environment



“Quick Look” Synopsis of DMT-O Requirements



- **Training**
 - Efficient, realistic, knowledge-based training
 - Robust wargaming/exercise capabilities with embedded coaching
 - Robust mission rehearsal capability
 - Efficient, high-fidelity and standardized systems
- **Modeling & Simulation**
 - Accurate, responsive, robust modeling, simulation and analysis capability
 - Distributed human performance models and knowledge management tools
- **Crew System Interfaces**
 - Capability to assess global conditions and events
 - Improved human interfaces with operational systems



Specific Technology Needs



- **Training Systems and Technology Challenges:**
 - Theater level complexity of synthetic environment
 - Multiple teams performing multiple missions
 - Varying timelines and information for each team
- **Needs from Industry:**
 - Knowledge skill, and competency based training tools
 - Scenario-based performance metrics
 - Training and exercise event planning and management tools
 - Cognitive and behavioral operator characteristics
 - Human performance models for individuals and teams
 - General coaching agents for HLA simulations
 - Codified specifications for SCORM (Shareable Courseware Object Reference Model)
 - LMS (Learning Management Systems) with hooks for configurable principled instructional support



Specific Technology Needs



- **Information Technology Challenges:**
 - Multiple legacy simulation systems requiring many different databases
 - Data correlation across all platforms
 - Rapid database generation/modification requirements
 - Dynamic updates to simulation environment
- **Needs from Industry:**
 - Integrated data management toolsets
 - Information fusion and just-in-time information support
 - Knowledge management agents and distributed libraries



Specific Technology Needs

- **Interconnection Technology Challenges:**
 - HLA migration for legacy systems
 - Linkage to constructive and live components
 - Interoperation of computers at varying security levels
- **Needs from Industry:**
 - Expanded Agile Federation Object Model development
 - Interfaces to live systems - e.g. Modular Control Equipment / Navy's DD-21 Training and Rehearsal Concept
 - Robust and flexible multi-level security capabilities, enabling distributed exercises and operations without disclosing operational capabilities

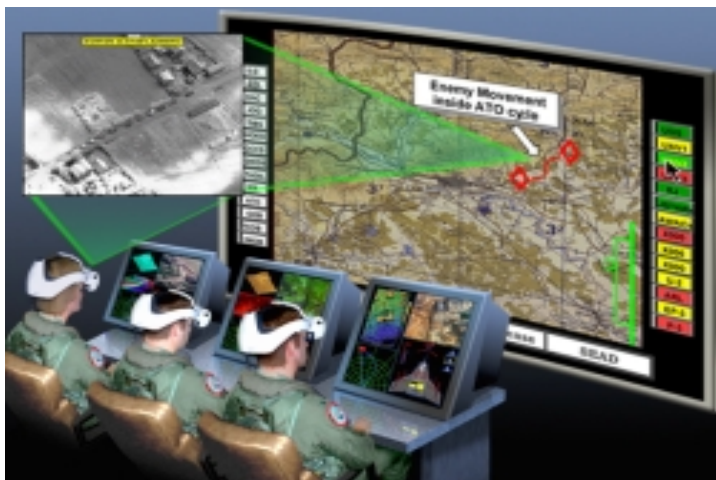




Specific Technology Needs



- **Visual Systems Technology Challenges:**
 - Instructor visualization of entire environment
 - Immersive brief/debrief tools
- **Needs from Industry:**
 - Virtual eye-point stealth technology
 - 3D visualization of virtual battlefield
 - Advanced multi-function data-wall designs for selective viewing of any station

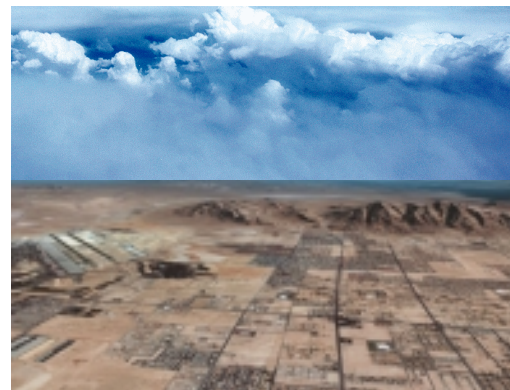




Specific Technology Needs



- **Representation Technology Challenges:**
 - Large numbers of intelligent semi-automated forces
 - Multi-spectral, geospecific terrain/feature databases
 - Appropriate simulation/stimulation of all sensor systems
- **Needs from Industry:**
 - Intelligent, high capacity computer-generated forces (people)
 - Real-time, behaviorally accurate threat system models
 - Environmental phenomena models
 - Rapid terrain/feature database development tools





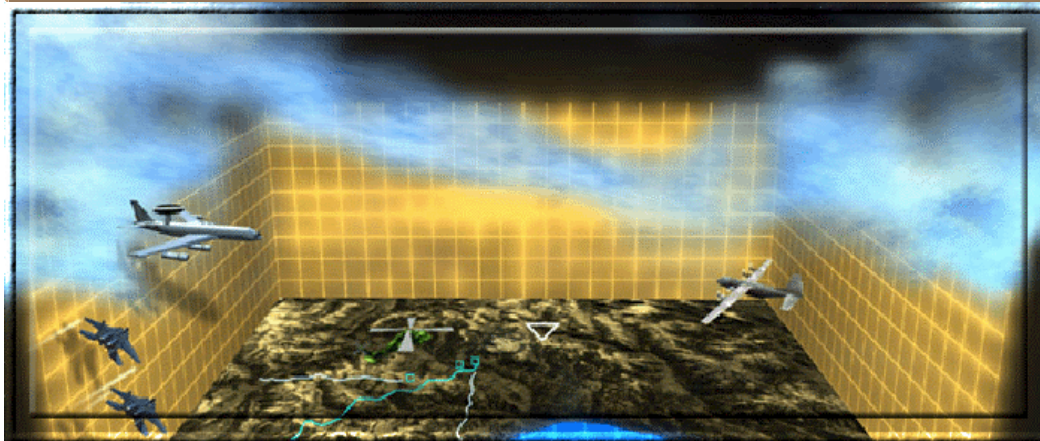
DMT: COMACCs View



“DMT will be the **only realistic way** we can get ISR and shooters hooked up to test and train modern evolutions of tactics - like time critical targeting - that requires real time interface among platforms that are too stressed by OPTEMPO **to train together in peacetime.**”

Gen John P Jumper, ACC/CC

Leveraging Simulation





Questions



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